DR-12

GOLD-NANOPARTICLES THIN FILMS AS PLATAFORM FOR LABEL-FREE IMPEDIMETRIC IMMUNOSENSOR FOR DETECTION OF *T. CRUZI* ANTIBODIES

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Abstract. Chagas disease (**CD**) is an important parasitic disease and recent estimates indicate that 6-7 million people are chronically infected by *T. cruzi*, mostly in Latin America. Development of a sensitive, label free electrochemical immunosensor for the qualitative detection of anti- *Trypanosoma cruzi* antibodies (*i.e.***CD**) in serum samples is described. A multilayered ultra-thin film consisting of cationic nanohybrid gold nanoparticles stabilized by 3-n-propylpyridinium silsesquioxane chloride (AuNPs-SiPy) and sodium poly(vinylsulfonate) (PVS) was deposited using the Layer-by-Layer (LbL) technique. Sensitized erythrocytes with *T. cruzi* antigens were immobilized in the $(AuNPSiPVS)_4$ LbL film, in which the biological reaction to detect anti-*T. cruzi* immunoglobulins was detected by electrochemical impedance spectroscopy. Each step of electrode modification and analytical performance of the immunosensors was characterized by the variation in charge transfer resistance values and thus the immunosensor was optimized through a fractional factorial design. The immunosensor showed good selectivity when incubated in a negative control sample and in a serum sample containing anti-Toxoplasma gondii antibodies, indicating potential for the qualitative detection of anti-*T. cruzi* antibodies in clinical diagnosis.

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